MRL Control Manual

2009. 08. 21

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1. Introduction

The purpose of this manual is to deliver information for successful installation, adjustment, restoration of elevator controller and inspection information to Service Engineer.
Elevator installation and adjustment must be performed by qualified personnel familiar with information, codes and regulation/legislation for the safe installation, adjustment, and operation of system.

This manual contains symbols that will help you safely perform and maintain the equipment.
Please follow the symbol that indicates important safety and technological information.

Caution : Injury or machine damage can occur when the procedure of installation and adjustment is not followed in manual.

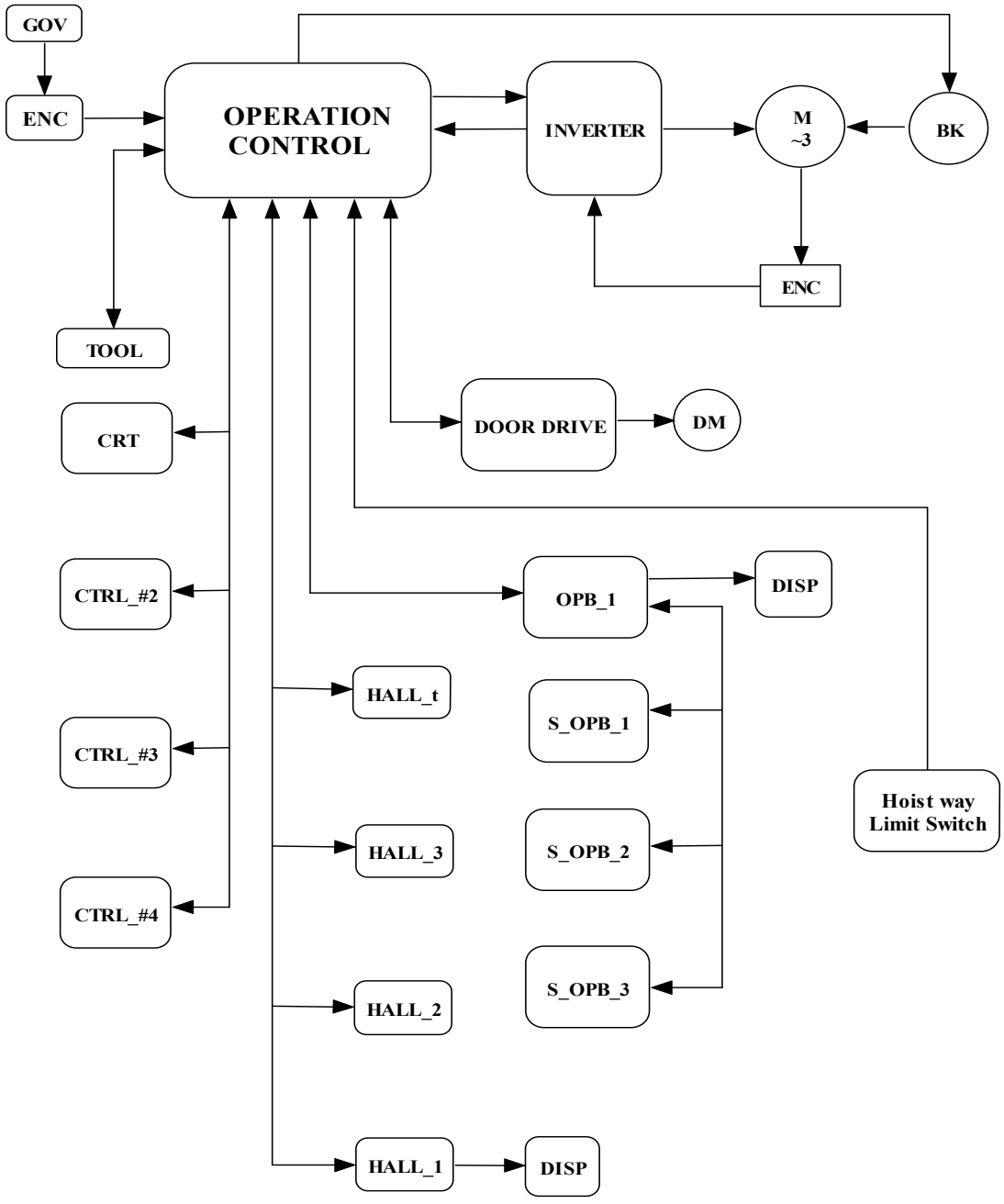
Warning : Machine can be damaged, if procedure of installation and adjustment is not done properly.

2. Control Panel Specification

ITEM	SPEC	REMARK
MODEL	HM-500A	
DIMENSION	1690(H) * 820(W) * 450(D)	
MOTOR	Synchronous, Asynchronous Motors	
CONTROL	PLC Control System(ML1400)	
INVERTER	Schneider Electric, Yaskawa	
SPEED	Not more than 500(fpm), 2.5(m/s)	
CAPACITY	Not more than 4500(lbs), 2000(Kg)	
MAIN VOLT	208(VAC), 480(VAC)	
LIGHT	AC 120 (VAC)	
SAFETY CHAIN	AC 110 (VAC)	
CONTROL CHAIN	DC 24 (VDC)	
DOOR	Belt type, INV Door / AC 230 (V)	
HP of MOTOR	7.5HP ~ 50HP	
SERIAL	CTRL ↔ OPB : CAN / RS485	
	CTRL ↔ HALL(B/T BD) : CAN / RS485	
	CTRL ↔ CTRL : RS485 / Ethernet	
	OPB ↔ VOICE : 6 BIT	
GROUP	4 CAR	
STOPS	32 STOP	
MAX. TRAVEL	300(ft), 91440(mm)	
MIN. HEIGHT	3.28(ft),1000(mm)	
POS./SPEED DETECT	ROTARY ENCODER (1024 P/R)	
LOAD DETECT	POTENTIOMETER, MICRO S/W	

3. Controller Composition

3-1 System Composition



3-2 Control Panel Component Function

1) PLC(ML1400)

Operation control, position control, safety circuit detection, OPB, HALL communication perform exterior I/O Input/Output control function.

2) INVERTER

Speed order from PLC that controls motor rotational frequency.

3) TRANS

Step-Down Transformer for Controller Power (TF1)
Step-Down Transformer for Brake and Fan Power (TF2)
Transformer for Door Operator Power (TF3)

4) SMPS

Supply Control Panel DC 24V and LOAD DETECTOR 10V power.

5) Contact

Motor Drive(K1,K2), Main Brake(K3,K4) and Emergency (E) Brake (K5,K6)

6) Braking Resistor

Consumption of generated sacrifice power as operative condition based on each load through sacrifice resistance.

7) Earth Bar

Earth Ground is connected to interior/exterior machinery of control panel.

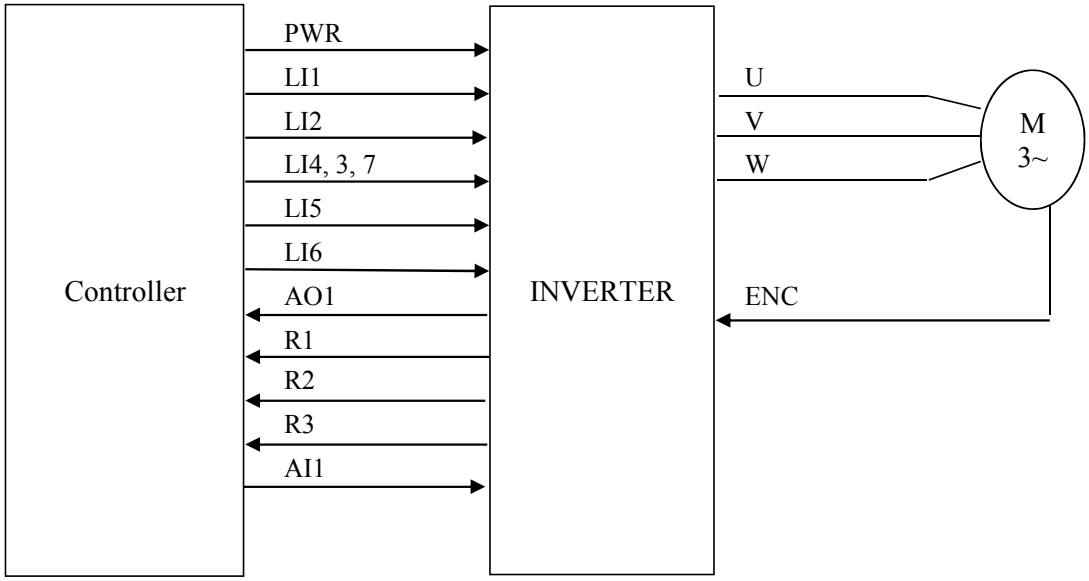
8) Harness/Terminal

Where connections are terminated for Control Panel, Exterior Connections and Signal Lines.

9) Switch Panel

Emergency Stop Switch, Auto/Insp Switch, Insp Up/Down Switch, Test Switch, Reset Switch
Hall Door Bypass Switch, Car Door Bypass Switch

3-3 Inverter Input/Output Composition

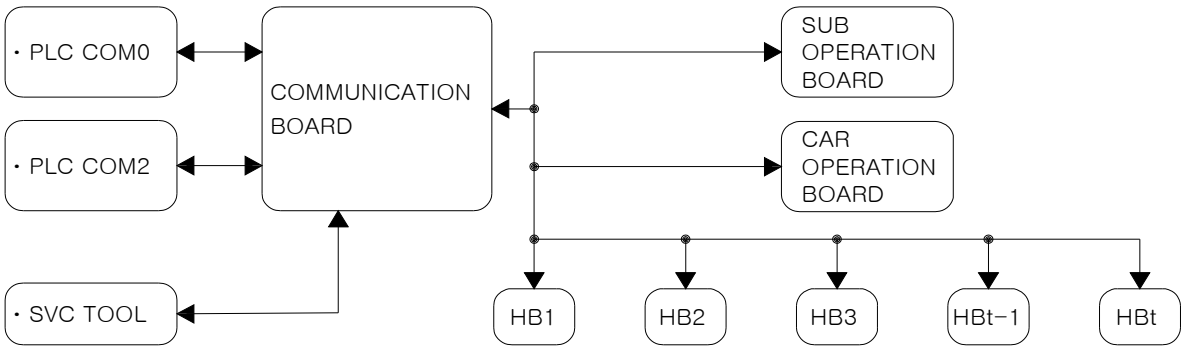


- PWR : Activates signal to make inverter operable
- LI1 : Up direction & leveling speed
- LI2 : Down direction & leveling speed
- LI3, 7 : Mult configuration
- LI4 : Car top speed
- LI5 : Inspection speed
- LI6 : When error occurred, reset input signal
- R1 : Inverter operation ready output signal
- R2 : Brake control
- R3 : Motor contactor control
- AO1 : Output frequency(0 ~ 10VDC)
- AI1 : Input load weight sensor

1) SPEED PATTEN Composition

LI1,2	LI3(7)	LI4	LI5	FUNCTION
1				Leveling Speed
1	1	1		Calibration, Earthquake
1		1		Contract Speed
1			1	Inspection Speed

3-4 Communication Composition



1) The communication system is CAN or RS-485 System.
   May be applied differently depending on the jobsite.
2) Car and hall Communication is done through the communication Board.
3) Communication board voltage is DC24V.
4) Communication line is Line 2.
5) Power line is separated. (DC24V, GND)

3-5 PLC(ML1400)

1) POWER : Input voltage/electric power 100 ~ 220V, output voltage DC24V.

2) CPU

- State/Condition Indicator LED
- Indicates the movement condition of RUN/PROG/FAULT of PLC, etc.
- Communication Port COM0,COM1,COM2 (RS232C / RS-485/Ethernet)
- COM0 : Port for communication board
- COM1 : Port for program download or exterior communication(CRT,GROUP)
- COM2 : Port for service tool connection

3) INPUT MODULE

- Input movement voltage : DC24V.
- Input address
  - Body of machine: I:0.00 to I:0.19
  - EXT Module1 : I:1.00 to I:1.15
  - EXT Module3 : I:3.00 to I:3.15

4) INPUT FUNCTION

Address	Name	Description
I:0.00	INA	Encoder Pulse A
I:0.01	INB	Encoder Pulse B
I:0.02	SAF	Safety Chain
I:0.03	INS	Auto / Inspection
I:0.04	INR	OPB Inspection Switch On
I:0.05	DW	Hall Door Switch
I:0.06	DFC	Door Full Close
I:0.07	DLR	Bottom Nominal Limit Switch
I:0.08	ULR	TOP Nominal Limit Switch
I:0.09	ST	Inverter Ready
I:0.10	FON	OPB Fire Key Switch On
I:0.11	FHD	OPB Fire Key Switch Hold
I:0.12	FMA	Main Floor Fire Sensor
I:0.13	FAL	All Floor Fire Sensor
I:0.14	FRH	Hall Fire Key Switch On
I:0.15	FBP	Hall Fire Key Switch Bypass
I:0.16	FLT	Float Switch

I:0.17	SBT	Sabbath Key Switch
I:0.18	FMC	Machine Room & Hoistway Fire Sensor
I:0.19	EQU	Earthquake Sensor
I:1.00	BKM	Break Switch Monitor
I:1.01	MKM	Motor Contactor Monitor
I:1.02	UIB	Inspection Up Button
I:1.03	DIB	Inspection Down Button
I:1.04	1DS	Bottom 1st Slow Down Limit Switch
I:1.05	1US	Top 1st Slow Down Limit Switch
I:1.06	2DS	Bottom 2nd Limit Switch
I:1.07	2US	Top 2nd Limit Switch
I:1.08	DPS	Door Bypass S/W
I:1.09	DZ	Door Zone Sensor
I:1.10	LD	Landing Down Sensor
I:1.11	LU	Landing Up Sensor
I:1.12	DOL	Door Open Limit Switch
I:1.13	DCL	Door Close Limit Switch
I:1.14	RDOL	REAR Door Open Limit Switch
I:1.15	RDCL	REAR Door Close Limit Switch
I:3.00	ETR	Emergency Terminal Stopping Relay
I:3.01	TSR	Test Function Relay
I:3.02	OL	Over Load
I:3.03	PMR	Phase Monitor Relay
I:3.04	DBC	Breaking Resistor Contact
I:3.05	RES	Reset Switch
I:3.06	TES	Test Switch
I:3.07	-	--
I:3.08	CWE	CWT Earthquake Detector
I:3.09	EMG	Emergency Power Contact
I:3.10	HND	Hall Independent Service SW
I:3.11	EMP	Emergency Power Service SW
I:3.12	HMD	Hall Medical Service SW
I:3.13	-	--
I:3.14	-	--

5) RY OUT MODULE (Relay OUTPUT)

- Output movement voltage: AC120, DC24V.
- Output terminal address
  - Body of machine : O:0.00 to O:0.11
  - EXT Module 2 : O:2.00 to O:2.15

Address	Name	Description
O:0.00	Li3	Mult Speed
O:0.01	Li5	Inspection Speed
O:0.02	Li4	Contract Speed
O:0.03	Li6	Inverter Reset
O:0.04		
O:0.05		
O:0.06	FX	UP Direction
O:0.07	RX	Down Direction
O:0.08	FWL	Fire Lamp
O:0.09	FWB	Fire Buzzer
O:0.10	EML	EMG Power Lamp
O:0.11	--	--
O:2.00	SAR	Safety On Output
O:2.01	ENR	Motor Enable Relay
O:2.02	LVR	Relevel Relay
O:2.03	CSB	Car Stop Switch Bypass
O:2.04	LR	Light Relay
O:2.05	FNR	Fan Relay
O:2.06	HSR	Contract Speed Relay
O:2.07	-	--
O:2.08	DO	Front Open Signal
O:2.09	DC	Front Close Signal
O:2.10	NDG	Front Nudging Signal
O:2.11	RDO	Rear Open Signal
O:2.12	RDC	Rear Close Signal
O:2.13	RNDG	Rear Nudging Signal
O:2.14	GTX	--
O:2.15	-	--

3-6 Car Operation Board Description

1) Transmit and receive information by communicating with control panel.
2) Register car call button.
3) Audible direction is activated.
4) Input each switch of Car.
5) Button lamp output.
6) Car chime output.
7) Car lantern output.
8) Communicate with sub OPB.
9) LED Function

RXA	COM1 Receive	LED1	Board movement indication, blinking 0.5Sec intervals
TXA	COM1 Transmit		
RXB	COM2 Receive	LED2	Not defined
TXB	COM2 Transmit	LED3	Not defined

10) SW1 Switch Function

S1	Not define
S2	Not define
S3	ON : 1~8 Stop / OFF : 1~32 Stop
S4	Board Test Program

11) SW2 Switch Function

S1	COM0 terminal resistance SW
S2	COM2 terminal resistance SW

12) J3 : Program downloader
13) J4 : Display connection port
14) J5 : Input expansion port (16F ~ 32F)

15) Connector Function

- COP Board

J1	4	P24
	3	N24
	2	COM1 485+
	1	COM1 485-
J2	1	P24
	2	N24
	3	COM2 485+
	4	COM2 485-

J10	1	Call Button 1
	2	Call Button 2
	3	Call Button 3
	4	Call Button 4
	5	Call Button 5
	6	Call Button 6
	7	Call Button 7
	8	Call Button 8
	9	COM(N24)
	10	COM(N24)

J11	1	Call Button 9
	2	Call Button 10
	3	Call Button 11
	4	Call Button 12
	5	Call Button 13
	6	Call Button 14
	7	Call Button 15
	8	Call Button 16
	9	COM(N24)
	10	COM(N24)

J8	1	DOB
	2	N24
	3	DOL
	4	P24
J9	1	DCB
	2	N24
	3	DCL
	4	P24

J12	1	Call Lamp 1
	2	Call Lamp 2
	3	Call Lamp 3
	4	Call Lamp 4
	5	Call Lamp 5
	6	Call Lamp 6
	7	Call Lamp 7
	8	Call Lamp 8
	9	COMM(P24)
	10	COMM(P24)

J13	1	Call Lamp 9
	2	Call Lamp 10
	3	Call Lamp 11
	4	Call Lamp 12
	5	Call Lamp 13
	6	Call Lamp 14
	7	Call Lamp 15
	8	Call Lamp 16
	9	COMM(P24)
	10	COMM(P24)

J17	1	Voice BIT1
	2	Voice BIT2
	3	Voice BIT3
	4	Voice BIT4
	5	Voice BIT5
	6	Voice BIT6
	7	N24
	8	P24

J14	1	COMM(N24)
	2	COMM(N24)
	3	FDOB
	4	FDCB
	5	IND
	6	BCN
	7	TCI
	8	--

J16	1	P24
	2	P24
	3	N24
	4	N24
	5	RDOB
	6	RDCB
	7	
	8	

* J13 will be applied as call button key switch if it is below 8 STOP.

J15	1	N24
	2	N24
	3	
	4	RLRD
	5	LRD
	6	

J20	1	P24
	2	N24
	3	LT _UP
	4	LT_DN

J18	1	P24
	2	N24
	3	CHM_UP
	4	CHM_DN

J19	1	P24
	2	N24
	3	BUZZER
	4	

J7	1	P24
	2	N24
	3	FDOBL
	4	FDCBL

J6	1	P24
	2	N24
	3	IN_SP1
	4	IN_SP2
	5	IN_SP3
	6	IN_SP4

3-7 Hall Button Description

1) Transmit and receive information by communicating with PLC.
2) Register hall button.
3) Parking SW INPUT
4) Hospital SW INPUT
5) Hall sensor INPUT
6) Communication extension port
7) Communication terminal resistance
8) Signal extension output

RXA	COM1 Receive	LED1	Board Movement Indication Blinking 0.5Sec Intervals
TXA	COM1 Transmit		
RXB	COM2 Receive	LED2	Not defined
TXB	COM2 Transmit	LED 3	Not defined

9) Connector Function

■ HB Board

J1	1	P24
	2	N24
	3	COM1 485+
	4	COM1 485-
J2	1	P24
	2	N24
	3	COM2 485+
	4	COM2 485-

J5	1	--
	2	--
	3	--
	4	HOSP
	5	WDHB
	6	WUHB
	7	DHB
	8	UHB
	9	COMM(N24)
	10	COMM(N24)

J7	1	--
	2	--
	3	--
	4	HOSPL
	5	WDHBL
	6	WUHBL
	7	DHBL
	8	UHBL
	9	COMM(P24)
	10	COMM(P24)

■ HIB Board

J1	4	P24
	3	N24
	2	COM1 485+
	1	COM1 485-
J2	1	P24
	2	N24
	3	COM2 485+
	4	COM2 485-

J3	1	UHB
	2	N24
	3	UHBL
	4	P24
J4	1	DHB
	2	N24
	3	DHBL
	4	P24

J5	1	WUHB
	2	N24
	3	WUHBL
	4	P24
J6	1	WDHB
	2	N24
	3	WDHBL
	4	P24

3-8 Hall Board Address Setting

FL'S	DIP SW SETTING FOR FLOOR							
	1	2	3	4	5	6	7	8
1	1	0	0	0	0	0	0	0
2	0	1	0	0	0	0	0	0
3	1	1	0	0	0	0	0	0
4	0	0	1	0	0	0	0	0
5	1	0	1	0	0	0	0	0
6	0	1	1	0	0	0	0	0
7	1	1	1	0	0	0	0	0
8	0	0	0	1	0	0	0	0
9	1	0	0	1	0	0	0	0
10	0	1	0	1	0	0	0	0
11	1	1	0	1	0	0	0	0
12	0	0	1	1	0	0	0	0
13	1	0	1	1	0	0	0	0
14	0	1	1	1	0	0	0	0
15	1	1	1	1	0	0	0	0
16	0	0	0	0	1	0	0	0
17	1	0	0	0	1	0	0	0
18	0	1	0	0	1	0	0	0
19	1	1	0	0	1	0	0	0
20	0	0	1	0	1	0	0	0
21	1	0	1	0	1	0	0	0
22	0	1	1	0	1	0	0	0
23	1	1	1	0	1	0	0	0
24	0	0	0	1	1	0	0	0
25	1	0	0	1	1	0	0	0
26	0	1	0	1	1	0	0	0
27	1	1	0	1	1	0	0	0
28	0	0	1	1	1	0	0	0
29	1	0	1	1	1	0	0	0
30	0	1	1	1	1	0	0	0
31	1	1	1	1	1	0	0	0
32	0	0	0	0	0	1	0	0

NOTE : 1 => ON , 0 => OFF

4. Service Tool Manual(DP-100)

DP-100 Tool is a portable service tool that contains a 4-line LCD display with 16-characters per line, with drive condition monitoring and data settings. It also contains 6 buttons.

1. [MENU] Button: Used to move back to previous menu.
2. [▲] [▼] [◄] [►]: Used to move cursor up, down, left or right.
3. [SET] Button: Used to select option where cursor is.

This tool will help you perform installation, final adjustments, testing procedures, and troubleshooting with efficiency. Main functions are as below;

1) Drive condition indication
2) Input and output of each data indication
3) Input each data necessary for operation/drive
4) Input floor indication data or drive data
5) Test mode & program
6) Calibration & drive control
7) Indication of occurred error details
8) Password input function

4-1 MENU

1) MONIT
2) SETUP
3) PROG
4) VIEW
5) STATUS
6) OPERAT

4-2. Initial Display Description

1) Initial display description: Once you turn on the power, display will show as followed.

M	O	D	:	A	U	T	O								
A	C	T	:	R	e	a	d	y							
F	L	R	:		1			D	I	R	:	U	p		
S	P	D	:	0	0	0	[	F	P	M	]				

If you press [▼], display will show as follows.

E	N	C	D	:	0	0	0	1	0	2	0	6			
D	A	T	E	:	1	1	:	2	9	:	1	3	:	0	9
V	I	N		:	0	0	.	0	0	(	V	)			

If you press [▲], display will move back to previous display.

2) MOD : indicates RUN MODE.

- AUTO : Auto Operation Mode .
- TOP INSP : Car Top Inspection Mode
- CAR INSP : Car Inspection Mode.
- CTRL INSP : Control Inspection Mode.
- CALIBRATION : Hoistway Learn Mode.
- PARKING : Parking Operation Mode .
- OP RUN : Operator Operation Mode.
- REPEAT RUN : Continual Operation Mode.
- INDPENDENT : Independent Operation Mode.
- ATTENDANT : Independent Operation Mode.
- FIREMAN CTRL : Fireman Operation Mode.
- EACH FLOOR : Each Floor Stop Operation Mode.
- HOSP CTRL : Hospital operation Mode.
- FIRE CTRL : Fire Control Operation Mode.
- SEISMIC CTRL : Seismic Control Operation Mode.
- UPS CTRL : Battery Operation Mode.
- GENERAT CTRL : Generator Operation Mode.
- RETURN HOME : Return Home Operation Mode.
- TEST CTRL : Test Control Operation Mode.

3) ACT

1) Indicates car drive condition.

2) Indicates error condition.

- Not Calibrate : Not hoistway learn
  Must perform before auto-drive.
- Calibrate Up : Hoistway learn up
  Ascending to ULS.
- Calibrate Down : Hoistway learn down
  Ascending to DLS
- Ready : Door Closed and Ready to Move
- Opening : Opening Door
- Door Open : Door Open
- Door Close : Door Close
- Acceleration : Drive On Acceleration
- Deceleration : Drive On Deceleration.
- High : Drive on Contract speed
- Relevel : Drive on Releveling
- Short Run : Drive to one floor
- Inspect Up : Drive On Inspection Up
- Inspect Dn : Drive On Inspection Down

4) FLR : Indicates current car floor.

5) DIR : Indicates drive direction of car. Indicates '--' when car stops.

6) SPD : Indicates drive speed of car as FPM

7) ENCD : Indicates encoder value in process operation.

8) DATE : Indicates present date and time.

9) VIN : Indicates DC voltage of motor speed output from inverter.

4-3. Password Input

Initial display-Press [MENU]

1) Input 4 digits of password (number).

=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=
<	P	a	s	s	w	o	r	d		I	n	p	u	t	>
	P	W	=	*	*	*	*								
=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=

2) Press [SET] Button to move to [SELECT MENU] if password number is correct.

4-4. Monitoring Menu

Initial LCD- Press [MENU]

1) Move cursor to MONIT by [▲] [▼] [◄] [►],
then press [SET]. Now Monitoring Menu is selected.

	[	S	E	L	E	C	T		M	E	N	U	]	
■	M	O	N	I	T				S	E	T	U	P	
	P	R	O	G					V	I	E	W		
	S	T	A	T	U	S			O	P	E	R	A	T

		[	P	L	C		I	N	P	U	T	1	]	
	•	S	A	F		•	D	W			-	B	K	M
	-	E	R	O		•	D	F	C		-	M	K	M
	-	I	N	A		-	R	D	Y		-	U	I	B

2) Symbol Signal (-), in front of abbreviation refers to OFF, and (●) refers to ON.

ex) ● SAF : Safety Chain ON

- SAF : Safety Chain OFF

3) INPUT Abbreviation Explanation

- SAF : Safety Chain
- ERO : Auto / Inspection
- INA : Car Inspection
- DW : Hall Door Locks
- DFC : Door Full Close (Gate Switch)
- RDY : Inverter Ready
- BKM : Brake Contact Monitor
- MKM : Main Contact Monitor
- UIB : Up Inspection Button
- ULS : Up Normal Switch
- 2US : Up 2nd Slow down Limit Switch
- 1US : Up 1st Slow down Limit Switch
- 2DS : Down 2nd Slow down Limit Switch
- 1DS : Down 1st Slow down Limit Switch

- DLS : Down Normal Switch
- LD : Down Leveling Sensor
- DZ : Door Zone Sensor
- LU : Up Leveling Sensor
- DIB : Down Inspection Button
- DBP : Door Bypass Switch
- DOL : Door Open Limit Switch
- DCL : Door Close Limit Switch
- RDOL : Rear Door Open Limit Switch
- RDCL : Rear Door Close Limit Switch
- FRH : Hall Fire Service Phase 1 Switch
- FBP : Hall Fire Service Bypass Switch
- FMA : Main Floor Fire Detection Sensor
- FAL : All Floor Fire Detection Sensor Without Main Floor
- FON : Fire Service Phase 2 ON Switch
- FHD : Fire Service Phase 2 HOLD Switch
- INH : Independent Switch in Hall
- FMC : Machine or Hoistway Fire Detection Sensor
- FLT : Float Switch
- DOB : Door Open Button
- DCB : Door Close Button
- IND : Independent Key Switch
- LRD : Car Photo Cell
- TCI : Car Top Inspection Switch
- HOP : Hospital Switch
- BCN : Call Cancel Button

4) OUTPUT Abbreviation Explanation

- SFR : Safety Output Relay
- UR : Up Direction Relay
- DR : Down Direction Relay
- ENR : Inverter Enable Relay
- LVR : Releveling Relay
- CSB : Car Stop Switch Bypass
- LR : Light Relay

- FNR : Fan Relay
- HSR : High Speed Relay
- TSR : Test Function Relay
- DO : Door Open Signal
- DC : Door Close Signal
- RDO : Rear Door Open Signal
- RDC : Rear Door Close Signal

5) Call Data

		[	C	A	L	L	D	A	T	A	1	]			
	1	o	↕			4	○	↕			7	○	↕		
	2	o	↕			5	○	↕			8	○	↕		
	3	○	↕			6	○	↕			9	○	↕		

- 1,2,3... : Elevator Floor
- ○ : Car Call OFF
- ● : Car Call ON
- ↕ : Up / Dn Button OFF
- ↑ : Up Button ON
- ↓ : Dn Button ON

6) Communication Monitor

	[	C	O	M	M	U	N	I	C	A	T	I	O	N	]
C	:	[	●	]	G	:	[								]
●	●	●	●	●	●	●	●								

- C:[O] : Car communication is not established.
- C:[●] : Car communication is established.
- G:[ ] : Shows elevator no. of group communication.
  (Shows master, slave no. from the left hand.)
- 3Line : Shows the status of hall communication (1F-16F)
- 4Line : Shows the status of hall communication (17F-32F)

7) Run Count

		[	R	u	n		C	o	u	n	t	]			
	0	0	0	0	1	1	6	0	:	t	i	m	e	s	

- Indicates total operation frequency of elevator.

8) Run Time

		[	R	u	n		T	i	m	e	]				
					0	0	0	0	9	:	h	o	u	r	
								1	2	:	m	i	n		
								4	3	:	s	e	c		

- Indicates total operation time of elevator.

4-5. Setup Menu

Initial LCD- Press [MENU]

Move cursor to SETUP by [▲] [▼] [◄] [►],

then press [SET]. Now SETUP menu is selected.

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 Row

	[	S	E	L	E	C	T		M	E	N	U	]		
	M	O	N	I	T			■	S	E	T	U	P		
	P	R	O	G					V	I	E	W			
	S	T	A	T	U	S			O	P	E	R	A	T	

1) SETUP Edit

- Each page has 2 parameters. Scroll through pages using [▲] [▼].
- Press [SET], then Cursor will appear on 1st row.
- If you press [SET] again, cursor will move to data position.
- When setting is completed, cursor will move to previous menu.
- To move to previous menu if you press [MENU]

4-5 SETUP Parameters

	R	V		O	n		T	i	m	e				
						0	5	0	0	[	m	s	e	c	]
	E	N	R		O	f	f		T	i	m	e			
						3	0	0	0	[	m	s	e	c	]

- Departure time after doors close (msec)
- ENR Contact OFF time after stop (msec)

	P	a	t	t	e	r	n		T	i	m	e			
						0	3	0	0	[	m	s	e	c	]
	B	r	a	k	e		O	n		T	i	m	e		
						0	2	0	0	[	m	s	e	c	]

- Speed Pattern ON time after activated (msec)
- Brake ON time after activated (msec) *Not applied

	G	T	X		O	f	f		T	i	m	e			
							3	0	0	[	s	e	c	]	
	D	R		O	p	e	r	a	t		T	i	m	e	
								0	5	[	s	e	c	]	

- GTX (E Brake) close time after Motor Stops (sec)
- Door Open Start time after Stop (msec)

	R	e	o	p	e	n		O	n		T	i	m	e	
							5	0	0	[	m	s	e	c	]
	C	a	r		D	R		T	i	m	e				
								0	3	[	s	e	c	]	

- When Reopen, Open Start time after Close Stop (msec)
- Car Call Door Time (sec)

	H	a	l	l		D	R	-	T	i	m	e		
								0	3	[	s	e	c	]
	R	e	o	p	e	n		D	R	-	T	i	m	e
								0	5	[	s	e	c	]

- Hall Call Door Time (sec)
- Reopen Door Time (sec)

	L	o	b	b	y		D	R	-	T	i	m	e	
								0	5	[	s	e	c	]
	N	u	d	g	i	n	g		T	i	m	e		
							0	6	0	[	s	e	c	]

- Lobby Door Time (sec)
- Nudging Door Time (sec)

	S	p	e	c	i	a	l		D	R		T	i	m	e
								0	5	[	s	e	c	]	
	A	b	n	o	r		D	R		T	i	m	e		
								6	0	[	s	e	c	]	

- Door Time (sec) when drive under control
- Door Time (sec) when drive by Abnormal

	L	a	n	t	e	r	n		F	-	T	i	m	e	
							3	0	0	[	m	s	e	c	]
	B	u	t	t	o	n		H	D		T	i	m	e	
								2	0	[	s	e	c	]	

- Lantern Flash Time (msec) * Not applied
- Detection Time (sec) when Hall Button is stuck

	E	Q		N	o	r	m	a	l		T	i	m	e	
						0	3	0	0	[	m	s	e	c	]
	R	E	T		F	l	o	o	r		T	i	m	e	
								0	2	0	[	s	e	c	]

- Operation Time (sec) when Earthquake detected
- Home return Time (sec)
  Travel standby time to home floor when it stops without hall call or car call.

	E	T	S		U	P		O	p	e	r	a	t	e	
								9	5	[	%	]			
	E	T	S		D	N		O	p	e	r	a	t	e	
								9	5	[	%	]			

- Motion speed/velocity(%) against ETS UP rated speed.
- Motion speed(%) against ETS DN rated speed.

	L	o	n	g		D	i	s	t	a	n	c	e		
							0	5	8	[	i	n	c	h	]
	S	h	o	r	t		D	i	s	t	a	n	c	e	
							0	0	0	[	i	n	c	h	]

- Long Run Distance (inch) 0 Speed to Contract Speed (Acceleration)
  Contract Speed to 0 Speed (Deceleration)
- Short Run Distance (inch) *Inverter will calculate

	3	R	U	N		D	i	s	t	a	n	c	e		
							0	0	0	[	i	n	c	h	]
	4	R	U	N		D	i	s	t	a	n	c	e	e	
							0	0	0	[	i	n	c	h	]

- 3Run Distance (inch) *Inverter will calculate
- 4Run Distance (inch) *Inverter will calculate

	O	v	e	r		R	u	n		T	i	m	e	
							0	0	0	[	s	e	c	]
	R	U	N	G		O	p	e	n		D	i	s	t
								0	2	[	i	n	c	h	]

- Set Single Over Run time (sec)
- Set Running Open Distance (inch) * Not applied

	L	i	g	h	t		T	i	m	e				
							0	2	0	[	m	i	n	]
	P	a	r	k	i	n	g		F	l	o	o	r	
								0	0	[	F	L	]	

- Set car Light OFF Time (minute)
- Set Parking Floor

	F	i	r	e		R	e	t	u	r	n		F	L
							0	2	0	[	F	L	]	
	F	i	r	e		F	u	n	c	t	i	o	n	
								0	1					

- Set Return Floor when Fire Service is ON
- Fire Service Function (1) New York, (0) New Jersey

	R	e	t	u	r	n		F	l	o	o	r		
								0	2	[	F	L	]	
	H	o	m	e		R	E	T		F	l	o	o	r
								0	1	[	F	L	]	

- Determine return floor while fireman operation is ON. **NOT USED**
- Homing Floor. (Will Bring Elevator to this floor after last call)

	C	o	n	t	r	a	c	t		S	p	e	e	d	
							2	0	0	[	F	P	M	]	
	S	e	t		M	l	o	t	o	r		R	P	M	
							0	8	5	[	R	P	M	]	

- Contract Speed
- Machine Motor RPM

	S	e	t		E	N	C	D		P	u	l	s	e	
						1	0	2	4	[	P	L	S	]	
	S	e	t		F	l	o	o	r						
								0	1	[	F	L	S	]	

- GOV Encoder Pulse
- Number of Floors

Warning : The system automatically resets once you check floor height, so do not change the pre-setting value unless it needs for communication test or special purpose.

	S	e	t		P	a	s	s	w	o	r	d			
						1	1	1	1						
	S	e	t		A	d	d	r	e	s	s				
								0	1						

- Set Password
- Set Control Address

	M	o	n	t	h			:	1	2					
	D	a	y					:	2	9					
	H	o	u	r				:	0	9					
	M	i	n	u	t	e		:	0	2					

- Set Month
- Set Day
- Set Hour
- Set Minute

Warning: **Upon the setup of Real Time Calendar (RTC), do not exceed the set rules (scope).**
Otherwise, there will be a fault with the PLC.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16 (Row)
	N	o	n		S	e	r	v	i	c	e		C	a	r	
2C							[		1	]						
3C	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4C	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

- Set Car Call Service Prohibition Floor
- Car Call will not be registered on configured/setting floor
- Bypassed when Emergency Operation is on
- 2nd Column indicates floor of Cursor location
- 3rd Column indicates floor from 1 to 16. (3C * 1R = 1F)
- 4th Column indicates floor from 17 to 32 (4C * 1R = 17F)
- Change the data by [▼] [▲]
- Change the Cursor by [◀] [▶]
- Changed data is set if you press [set]
- Car Call can be registered on Floor set 0
- Car Call can not be registered on Floor set 1

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16 (Row)
	N	o	n		S	e	r	v	i	c	e		H	a	l	l
2C							[		4	]						
3C	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4C	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

- Set Hall Call Service Prohibition Floor
- Hall Call is not registered on configured/set Floor
- 2nd Column indicates floor of cursor location
- 3rd Column indicates floor from 1 to 16 (3C * 1R = 1F)
- 4th Column indicates floor from 17 to 32 (4C * 1R = 17F)
- Change the data by [▼] [▲]
- Change the Cursor by [◀] [▶]
- Changed data is set if you press [SET]
- Hall call can be registered on Floor set 0
- Hall call can not be registered on Floor set 1

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16 (Row)
	A	l	w	a	y	s		S	t	o	p		U	p		
2C							[		4	]						
3C	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4C	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

- Set regular stop floor when car moves up
- 2nd Column indicates floor of Cursor location
- 3rd Column indicates floor from 1 to 16 (3C * 1R = 1F)
- 4th Column indicates floor from 17 to 32 (4C * 1R = 17F)
- Change the data by [▼] [▲]
- Change the Cursor by [◀] [▶]
- Changed data is set when you press [SET]
- Floor set 1 always stops when car moves up, irrespective of call

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16 (Row)
	A	l	w	a	y	s		S	t	o	p		D	o	w	n
2C							[		4	]						
3C	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4C	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

- Set regular floor when car moves down
- 2nd Column indicates floor of cursor location
- 3rd Column indicates floor from 1 to 16 (3C * 1R = 1F)
- 4th Column indicates floor from 17 to 32 (4C * 1R = 17F)
- Change the data by [▼] [▲]
- Change the Cursor by [◀] [▶]
- Changed data is set if you press [set]
- Floor set 1 always stops when car moves up, irrespective of call

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16 (Row)
	R	e	a	r		D	o	o	r		O	p	e	n		
2C							[		4	]						
3C	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4C	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

- Set floor of rear direction door open.
- 2nd Column indicates floor of cursor location.
- 3rd Column indicates floor from 1 to 16. (3C * 1R = 1F)
- 4th Column indicates floor from 17 to 32. (4C * 1R = 17F)
- Change the data by [▼] [▲]**.**
- Change the Cursor by [◀] [▶]**.**
- Changed data is set if you press [SET]**.**
- Rear Door is open where floor set 1.

Warning : Do not set up in case of break-through floor
Depending on the direction of the Call, it automatically selects Front or Rear.
If you select "Rear", the Rear door will activate regardless of the call selection.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16 (Row)
	S	e	c	r	u	i	t	y		F	l	o	o	r		
2C							[		4	]						
3C	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4C	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

- If a key is installed with call button, which is a safety function
- Since the elevator arrived, the open button will not function after the door has opened.
- To open the door, turn the key and press the floor # button.
- 2nd Column indicates the floor of cursor placement .
- 3rd Column indicates floor #1-16.
- 4th Column indicates floor #17-32.
- Make changes to data by using [▼][▲].
- Make changes to the cursor by using [◀][▶] .
- Set data by pressing [SET].
- Security system will activate to the floors set as 1.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16 (Row)
	G	r	o	u	p		N	o	n		F	l	o	o	r	
2C							[		4	]						
3C	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4C	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

- Excludes floor under group operation.
- 2nd Column indicates the position and the floor level of the cursor.
- 3rd Column indicates floor #1-16.
- 4th Column indicates floor #17-32.
- Change data by using [▼][▲].
- Change cursor by using [◀][▶].
- Set the changed data by pressing [SET].
- If you set up as '1', the elevator will be excluded from group operation, so double check the operation status.

	1	2	3	4	.	.	.	.	.	.	.	.	13	14	15	16 (Row)
1C	L	o	a	d		D	e	t	e	c	t	=	0	2	.	2
2C	■	[			0	%	]	=	0	0	.	0				
3C		[	3	0	0	L	]	=	0	0	.	0				
4C		[		5	0	%	]	=	0	0	.	0				

- Mode that applied Elevator Load to detective System.
- Data with detected Load will be on 1C,13~16R
- Data contains DC voltage, range 0 ~ 10 (VDC).
- 2C : Set voltage with Empty Load. (Adjust Switch to have ~2.0 VDC with Empty Car)
- 3C : Set voltage when 300 lbs or load for two persons.
- 4C : Set voltage when 50% of load**.**
- If you press [SET], cursor will blink on 2C,1R. Move by **[▼] [▲]**, and if you press [SET], data will be entered on Column where cursor is located.

	1	2	3	4	.	.	.	.	.	.	.	.	13	14	15	16	(Row)
1C	L	o	a	d		D	e	t	e	c	t	=	0	7	.	5	
2C	■	[		8	0	%	]	=	0	0	.	0					
3C		[	1	0	0	%	]	=	0	0	.	0					
4C																	

- 2C : Set voltage when 80%of load**.**
- 3C : Set voltage when 100% of load.
- If you press [SET], cursor will blink on 2C,1R. Move by [▼] [▲], and if you press [SET], data will be entered on column where cursor is located.

	1	2	3	4												16	(Row)
1C		E	x	c	e	s	s		C	a	l	l					
2C													Y	e	s		
3C	■	T	o	g	g	l	e		C	a	l	l					
4C													Y	e	s		

- Set Anti-Nuisance Call Protection. (Yes, No)
- Set 2 touch Call Cancel Function. (Yes, No)

	1	2	3	4												16	(Row)
1C		F	i	r	e		K	e	y		S	w	i	t	c	h	
2C									3	K	e	y		S	W		
3C	■	B	r	a	k	e		D	e	t	e	c	t				
4C													Y	e	s		

- Set Hall Fire Key (2 or 3). (2 Position Key SW, 3 Position Key SW)
- Set Brake SW Motion Detect Function. (Yes, No)

	1	2	3	4											16 (Row)
1C		M	G		D	e	t	e	c	t					
2C													Y	e	s
3C	■	E	L	E		R	e	t	u	r	n				
4C							P	r	o	x	i	m	i	t	y

- Set Magnet Connect Motion Detect Function. (Yes, No)
- Set Proximity floor and Bottom floor when elevator returns. (Proximity, Bottom)

	1	2	3	4											16 (Row)
1C		D	o	w	n		B	e	e	p	i	n	g		
2C												O	n	c	e
3C	■	F	i	r	e		D	o	o	r		B	T		
4C								F	i	r	e		B	o	x

- Passing Tone. (Once, Twice)
- Set to select Open/Close buttons in Fire Box or on COP (Normal). (Fire Box, Normal)

	1	2	3	4											16 (Row)
1C		G	r	o	u	p		C	o	n	t	r	o	l	
2C											A	p	p	l	y
3C	■	L	a	n	t	e	r	n		C	o	n	t	r	o	l
4C							D	i	r	e	c	t	i	o	n

- Group control (operation) apply.
- Hall Lantern: If this function is set to Forecast once Hall Button is pressed Hall Lantern will light indicating which elevator will answer call. If set to Direction once elevator arrives hall lantern will light. (Forecast, Direction)

4-6. PROG Menu

Initial LCD- Press [MENU]

Locate cursor on PROG by [▲] [▼] [◂] [▸], PROG Menu is selected if you press [SET] Button.

Scroll through pages by using [▲] [▼].

	[	S	E	L	E	C	T		M	E	N	U	]	
	M	O	N	I	T				S	E	T	U	P	
■	P	R	O	G					V	I	E	W		
	S	T	A	T	U	S			O	P	E	R	A	T

	[	S	E	L	E	C	T		M	O	D	E	]	
■	N	T	S							T	E	S	T	
	E	T	S							T	E	S	T	
	C	A	R		B	U	F	E		T	E	S	T	

1) NTSD (Normal Terminal Stopping Device), ETSD (Emergency Terminal Stopping Device) and Car Buffer Test

- Select desired test by [▲] [▼]. Then Press [SET] to choose.
- Select UP/DOWN or YES/NO by [▲] [▼]. Then Press [SET] to choose.

■	C	W	T		B	U	F	E		T	E	S	T	
	B	K	E		T	R	A	C		T	E	S	T	
	O	V	E		S	P	D	E		T	E	S	T	

2) Counterweight Buffer Test, Break Traction Test and Overspeed Test

- Select desired test by [▲] [▼]. Then Press [SET] to choose.
- Select UP/DOWN or YES/NO by [▲] [▼]. Then Press [SET] to choose.

NOTE: Refer to Elevator Safety Test Section for Complete Testing Procedures.

3) Program1

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16 (Row)
				[	P	R	O	G	R	A	M	1	]			
2C		T	i	m	e	:	[	0	5	]	:	[	1	0	]	
3C	■	F	l	o	o	r		=		[	0	2	]			
4C																

- In PROG Menu, use [▲][▼] to get to PROGRAM 1.
- Press [SET] then use [▲][▼] to select the Time and the Floor.
- Once you select your Time and/or Floor, press [SET] to edit your data.
- 2C, 8&9R indicates the Start Time; 13&14R indicates the Finish Time.
- 3C, 11&12R indicate the return floor.
- If Floor = 0, then the car will not move and will be on standby.

EX) The above LCD shows from 5 AM to 10 AM the elevator will operate normally, then return to 2nd floor.

4) In addition to Program 1, you can create 3 more programs, numbered 2~4.

			[	P	R	O	G	R	A	M	2	]			
	T	i	m	e	:	[	1	0	]	:	[	1	6	]	
■	F	l	o	o	r		=		[	0	7	]			

- From 10AM to 4PM, Home to 7th Floor.

			[	P	R	O	G	R	A	M	3	]			
	T	i	m	e	:	[	1	6	]	:	[	2	0	]	
■	F	l	o	o	r		=		[	0	1	]			

- From 4PM to 8PM, Home to 1st Floor.

			[	P	R	O	G	R	A	M	4	]			
	T	i	m	e	:	[	2	0	]	:	[	0	5	]	
■	F	l	o	o	r		=		[	0	5	]			

- From 8PM to 5AM, Home to 5th Floor.

4-7. VIEW Menu

Initial LCD- Press [MENU]

Locate cursor to View by [▲] [▼] [◀] [▶],

then VIEW Menu is selected if you press [SET] .

	[	S	E	L	E	C	T		M	E	N	U	]	
	M	O	N	I	T				S	E	T	U	P	
	P	R	O	G				■	V	I	E	W		
	S	T	A	T	U	S			O	P	E	R	A	T

1) You can edit Car Position Indicator and Hall Position Indicator Display.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	(ROW)
1C		[	D	i	s	p	l	a	y		E	d	i	t	]		
2C																	
3C		[	0	2	]	:	F	L		=		[		2	]		
4C																	

- 3C, 3&4R, indicate floor.
- 3C, 13&14R, indicates Display letter.
- Cursor is floor, location if you press [SET].
- Edit Floor can be moved by [▲] [▼]
- Cursor is data, location if you press [set].
- Data can be edited by key [▲] [▼].
- Letter of R,B,F,L,M,P,G,-,C,H are available as well as applied letter.
- Press [set] after data is edited.
- Press [menu] then move back to previous menu.

2) You can edit Car Announcement.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16 (ROW)
1C		[	A	n	n	o	u	n	c	e	m	e	n	t	]	
2C		[	0	2	]	:	F	L		=		[		2	]	
3C	"	S	e	c	o	n	d		F	l	o	o	r			
4C																

- 2C, 3&4R indicate floor.
- 2C, 13&14R, 13&14R indicates display letter.
- Cursor is floor, location if you press [set].
- Edit Floor can be moved by [▲] [▼]
- Cursor is data, location if you press [set].
- Data can be edited by key [▲] [▼].
- 3&4 line indicates information about the data.

4-8. STATUS Menu

Initial LCD- Press [MENU]

Locate cursor to STATUS by [▲] [▼] [◄] [►].

If you press [SET], STATUS Menu is selected.

	[	S	E	L	E	C	T		M	E	N	U	]		
	M	O	N	I	T				S	E	T	U	P		
	P	R	O	G					V	I	E	W			
■	S	T	A	T	U	S			O	P	E	R	A	T	

		[	E	R	R	O	R		D	I	S	P	Y	]	
2C		[	1	2	:	0	5	:	1	7	:	3	5	]	
3C		[		0	0	1		E	R	:	0	0	1	]	
4C		[		0	3	F		U	P					]	

a. Error Code Display

Display Type : 2C [Month / Day / Hour / Minute]

: 3C [Number / Error Code]

: 4C [Floor / Direction]

4-9. OPERAT Menu

Initial LCD- Press [MENU]

Locate cursor to OPERATE by [▲] [▼] [◄] [►],

then OPERAT Menu is selected if you press [SET]

	[	S	E	L	E	C	T		M	E	N	U	]	
	M	O	N	I	T				S	E	T	U	P	
	P	R	O	G					V	I	E	W		
	S	T	A	T	U	S		■	O	P	E	R	A	T

1) Calibration

	[	C	A	L	I	B	R	A	T	I	O	N	]	
	W	o	r	k		:	s	e	t					
	N	e	x	t		:	d	o	w	n				

- Verify the completion of installation before calibration.
- Press [SET] to enable Calibration Mode.

	[	C	A	L	I	B	R	A	T	I	O	N	]	
							[	Y	e	s	]			

- Activate to get necessary hoistway data for elevator operation.
- Cursor is appeared if you press [SET]
- Select [Yes] by [▲] [▼] and then Press [SET].
- Once calibration is activated, car will move down from present location to DLS.
- Then the car will move up from DLS to ULS.
- Then the car will level down from ULS and stop at top floor landing. PLC will save the data and calibration will be done.
- Once calibration is done, set the necessary data for Operating Display and Distance.

2) Call Input

		[	C	A	L	L		I	N	P	U	T	]		
W	o	r	k						:		s	e	t		
P	r	e	v	i	o	u	s		:		u	p			
N	e	x	t						:		d	o	w	n	

- Press [SET] to select Call Input Mode.

		[	C	A	L	L		I	N	P	U	T	]		
	F	=	[		2	]		C	=	[		4	F]		
0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

- Mode that car can be operated as Operator
- F = indicates present Car location.
- C = indicates present Cursor location.
- Move cursor where you intend to move by [◄] [►].
- Set floor of data as 1 where you intend to move by [▲] [▼].
- Once you set data and press [SET], car is automatically operated.

3) REPEAT OPERATION

	[	R	E	P	E	A	T		O	P	E	R	]		
			E	V	E	N			[	N	O	]			
				O	D	D		[	Y	E	S	]			
			E	A	C	H			[	N	O	]			

- This is the Auto Repeat Operation mode.
- Press [SET] to go to the select menu.

	[	R	E	P	E	A	T		O	P	E	R	]		
			E	V	E	N			[	N	o	]			
				O	D	D		[	Y	e	s	]			
			E	A	C	H			[	N	o	]			

- Select which mode to apply with [▲][▼].
- Press [SET] to go to the cursor, then use [▲][▼] to select YES or NO.

	[	R	E	P	E	A	T		O	P	E	R	]		
			E	V	E	N			[	N	O	]			
				O	D	D		[	Y	E	S	]			
			E	A	C	H			[	N	O	]			

- After selecting Drive mode, press [SET] to drive continuously.
- You are able to set 1 operation mode at a time. If you change the mode, then the previous mode will turn to NO.

5. Inverter User Manual

5-1. Buttons

1. Esc: Return to the previous stage.
2. F2 : When input numeric data, moves cursor one digit to the left.
3. F3 : When input numeric data, moves cursor one digit to the right.
4. Ent(Round shape) : Data selection with click. Turn counterclockwise to decrease the numbers, turn clockwise to increase the numbers. Also can be used for cursor movement.

5-2. Setting Procedures before INSP Operation

1. Connect the power line between Machine Room disconnect and Control Panel.
2. Connect the power line between Control Panel and Traction Machine & Encoder line.
3. If the 3 phase power has been connected correctly, PMR Relay and SAF M/G turn "ON".
4. If PMR does not turn "ON", switch S and T Phase.
5. As soon as proper connections are completed, Monitoring screen will display on Inverter Keypad.
6. Preliminary Data is set at HM TEC's factory per rated capacity and speed.
7. Input Car Capacity and Car and Counterweight Weight per drawing.

5-3. How to Input Car Capacity and Car and Counterweight Data

1. Click [ENT] in Monitoring Menu
2. Scroll to Drive Menu then Click [ENT]
   - Scroll to Lift then Click [ENT]
   - Scroll to Lift Configuration then Click [ENT]
   - Scroll to Lift Data then Click [ENT]
   - Scroll to Capacity of Lift then Click [ENT], a number will appear [F2] will move cursor left, [F3] will move cursor to right, Round shaped key increases and decreases numerical value. Click [ENT] when desired capacity is entered
   - Scroll to Car Weight then Click [ENT], enter 1/2 of Car Rated Load using the same procedures.
   - Scroll to Counter Weight then Click [ENT], enter 1/2 of CWT Rated Load using the same procedures.
3. Click [ESC] continuously until you return to the Monitoring Menu
4. Confirm Car Direction movement by using the Up/Down Toggle Switch on INSP mode.
5. If direction is correct and motor runs smoothly manual work is completed and elevator will move on INSP.

5-4. How to Correct Rotation of Motor.

1. Switch Phases V and W in the Control Panel, which are connected to the motor
2. Click [ENT] in Monitoring Menu
3. Scroll to Drive Menu then Click [ENT]
4. Scroll to Inputs/Outputs CFG then Click [ENT]
5. Scroll to Encoder Configuration then Click [ENT]
   - Scroll to Coder Rotation Inv then Click [ENT]
     - If NO is checked change to YES and vice-versa then Click [ENT]
   - Scroll to Encoder Check then Click [ENT]
     - Change to Done then Click [ENT]
6. Click [ESC] twice to return to the Drive Menu

7. Scroll to Motor Control then Click [ENT]
   - Scroll to Angle Test Setting then Click [ENT]
   - Scroll to Angle Auto-Test then Click [ENT]
     - Change from NO to YES then Click [ENT]
     - Hold In ENR Relay
     - Angle Auto Test changed to Done
8. Check rotation with Up/Down Toggle Switch on INSP mode, if correct manual work is completed and elevator will on INSP mode.
9. Check rotation with Up/Down Toggle Switch on INSP mode, if correct manual work is completed and elevator will on INSP mode.

5-5. Inverter Setting Tips before AUTO Operation

1. Check safety chain, make sure all jumpers are removed.
2. Make sure all jumpers are removed from contacts.
3. Change Weight Sensor
   - Click [ENT] in Monitoring Menu
   - Scroll to Drive Menu then Click [ENT]
   - Scroll to Lift then Click [ENT]
   - Scroll to Lift Configurations then Click [ENT]
   - Scroll to I/O Assignments then Click [ENT]
   - Scroll to Inputs then Click [ENT]
   - Scroll to Weight Sensor Ass. then Click [ENT]
     - Change into Ai1 then Click [ENT]
   - Click [ESC] continuously until you return to Drive Menu
4. Inspection Speed (0 Hz)
   - Scroll to Lift then Click [ENT]
   - Scroll to Lift Functions then Click [ENT]
   - Scroll to Inspection Mode then Click [ENT]
   - Scroll to Inspection Speed then Click [ENT]
     - Change from 6.0 Hz to 0.0 Hz then Click [ENT]
5. Run elevator Up on INSP mode, car will not move, it will output data for steps 7 and 8.
6. After Data is outputted return Inspection Speed to 6.0 Hz using the above procedure.

7. Load Cell Configuration (0% Load Case)
   - Click [ENT] in Monitoring Menu
   - Scroll to Drive Menu then Click [ENT]
   - Scroll to Monitoring then Click [ENT]
   - Scroll to I/O Map then Click [ENT]
   - Scroll to Analog Inputs Image then Click [ENT]
     - Record Value in Ai1
   - Click [ESC] continuously until you return to MONITORING
     - Record Value in Motor Current when running on inspection
     - Record Value in Motor Torque when running on inspection

8. Load Cell Configuration (100% Load Case)
   - Click [ENT] in Monitoring Menu
   - Scroll to Drive Menu then Click [ENT]
   - Scroll to Monitoring then Click [ENT]
   - Scroll to I/O Map then Click [ENT]
   - Scroll to Analog Inputs Image then Click [ENT]
     - Record Value in Ai1
   - Click [ESC] continuously until you return to MONITORING
     - Record Value in Motor Current when running on inspection
     - Record Value in Motor Torque when running on inspection

6. INSTALLATION

6-1. Initial Start-Up

- Follow instructions outlined in the Inverter Manual Section for operation on INSP.

6-2. Wiring (CAUTION)

- Wiring should be accurate based on drawings.
- When you wire the power line, power voltage should be checked first and off before you start to wire. Danger of electronic shock.
- Power lines (RST) or (UVW) should be separated from signal line and shielded.
- Standard lines should be used for wiring.
- Be careful not to switch the power input line and motor output line. Machines can be damaged.
- Motor output line, Encoder line, Regenerative braking resistance line should be shielded.
- Be careful not to switch the motor wirings (UVW).
- Control Panel, Motor, Regenerative braking resistance box, Battery box, Wiring Duct, etc. should be grounded.
- Correctly connect Encoder lines.(Voltage/Electronic power, A Phase, B Phase)
- Encoder data value can be checked on Service Tool.
- Encoder data value can be checked on PLC.
- Each terminal connection or volt fastening should be checked.
- Insulation resistance should be measured whether it exceeds the standard value.

6-3. Wiring Tips

Starting Point	Ending Point	Abbreviation	Location	Description
T1-1	T1-2	OS	M/C Room	Governor Speed Stop Switch
When Over speed stop switch is on, controller GTS relay is ON.[T1-1 ~ T1-2]				
T1-5	T1-20	CES	Controller	Run/stop Switch mounted on controller
JH1-1(T1-20)	-	UFL	Hoistway	Up Final Limit Switch
-	-	DFL	Hoistway	Down Final Limit Switch
-	T1-21	PES	PIT	Pit Emer`s Stop Switch
Direct connection of hoistway safety line from UFL Limit Switch to PES Switch.[T1-5 ~ T1-21]				
T1-21	-	GTS	PIT	Governor Tension Switch
-	T1-22	CSS	PIT	Comp Chain Stop Switch
T1-22	-	WBS	PIT	CWT Buffer Stop Switch
-	T1-23	CBS	PIT	Car Buffer Stop Switch
Direct connection of hoistway safety from GTS Switch to CBS Limit Switch[T1-21 ~ T1-23]				
T1-23	JH1-2(T1-24)	HES	Top of hoistway	Governor checking Access Door Switch
MRL Type Governor Access Door Switch [T1-23 ~ T1-24]				

Starting Point	Ending Point	Abbreviation	Location	Description
JEC-1(T1-24)	JEC-2	EEC	Car Top	Exit Stop Switch(Use 2 pcs of Switch)
CL1-1	CL1-2	CLC1	Car Top	Clamp Stop Limit Switch1
CL2-1	CL2-2	CLC2	Car Top	Clamp Stop Limit Switch2
JIN-6	JIN-7(T1-25)	TES	Car Top	EMER`S Stop Switch
Direct connect from Car Top Exit S/W to EMER`S Stop Switch.[T1-24 ~ T1-25]				
COS-1(T1-25)	COS-2	COS	Car Top	Car Device Stop Switch
SLS-1	SLS-2(T1-26)	SLS	Car Top	Car Rope Slack Stop Switch
Direct connection from Car Device Switch to Car Rope Slack Switch.[T1-25 ~ T1-26]				
JE1-1(T1-26)	JE1-2	ES1	In Car	Main COP Emer`s Stop Key Switch
JE2-1	JE2-2(T1-27)	ES2	In Car	Sub COP Emer`s Stop Key Switch
Main & Sub COP EMER`S Stop Key Switch direct connection [T1-26 ~ T1-27]				
★★. In case of Primary Fireman Operation, the EM. Stop function does not work because of T1-26 and T1-27 JUMP				
JGS-1(T1-28)	JGS-2	GS	Car Door	Front Car Door Switch
JRG-1	JRG-2(T1-29)	RGS	Car Door	Rear Car Door Switch
Front & Rear Car Door Switch Direct connection [T1-28 ~ T1-29]				
JH1-3(T1-30)	JH1-3(T1-31)	DS,RDS	Hall Door	Front & Rear Hall Door Switch
Front & Rear Hall Door Limit Switch Direct connection[T1-30 ~ T1-31]				
JH2-1(T1-32)	JH2-4(T1-33)	DLS	Hoistway	Down Normal Limit Switch
JH2-1(T1-32)	JH2-7(T1-34)	ULS	Hoistway	Up Normal Limit Switch
DLS Limit Switch [T1-32 ~ T1-33], ULS Limit Switch [T1-32 ~ T1-34]				

Terminal	Ending point	Abbreviation	Location	Description
13	+24V	ENC P24	Machine Room	GOV. Encoder Power line(+24V - Red Color)
14	0V	ENC N24	Machine Room	GOV. Encoder Power Line(0V - Black Color)
15	A	INA	Machine Room	GOV. Encoder A (A - Green Color)
16	B	INB	Machine Room	GOV. Encoder B (B - White Color)
Connect GOV. Encoder to GOV. Machine, and connect to control panel terminal. Check with Manual UP(ENC COUNTER increase),DOWN(ENC COUNTER decrease). If the increase and decrease reversed, switch the wire between ENC A, and B.				

1. COP Board Communication Wiring and confirmation of Communication

- Wiring
  - Connect #4 pin of COP Board J1 Housing 35156-4P to CM1-1(P24)
  - Connect #3 pin of COP Board J1 Housing 35156-4P to CM1-2 (N24)
  - Connect #2 pin of COP Board J1 Housing 35156-4P to CM1-3 (RT+)
  - Connect 31 pin of COP Board J1 Housing 35156-4P to CM1-4 (RT-)
- Confirmation of Communication and Error fix tips :
  - Check the flickering speed of car communication board, ‘LED(LTX3). If it flashes fast, it is fine. If not, try to switch the black and white communication wire(A,B), check again the flickering speed.
  - Check the flickering speed of LD1 and TxA LED on COP Board. If it flashes fast, it is fine. If not, try to switch the wire between RT(+) and RT(-) .

2. Hall Board Communication Wiring and Confirmation of Communication

- Wiring
  - Connect Red Color Wire to Housing 5557-6P #1 Pin (P24)
  - Connect Green Color Wire to Housing 5557-6P #2 Pin (N24)
  - Connect Black Color Wire to Housing 5557-6P #3 Pin (RT+)
  - Connect White Color Wire to Housing 5557-6P #4 Pin (RT-)
- Confirmation of Communication and Error fix tips :
  - Check the flickering speed of Hall communication LED in control panel, If it flashes fast, it is fine. If not, try to switch the wire between black and white color RT(+), RT(-). Check again the flickering speed.
  - Check the flickering speed of LD1 & TxA LED on Hall Button. If it flashes fast, is fine. If not, try to switch the wire between RT(+) and RT(-), then double check the LED flickering speed.
  - In case none of the above mentioned works, remove all communication lines, and recheck it floor by floor while rewiring from the top floor. (But, remove the wiring in the revered order of wiring). If you find an error floor, try to replace the Hall Button Board, and double check the LED flickering speed.

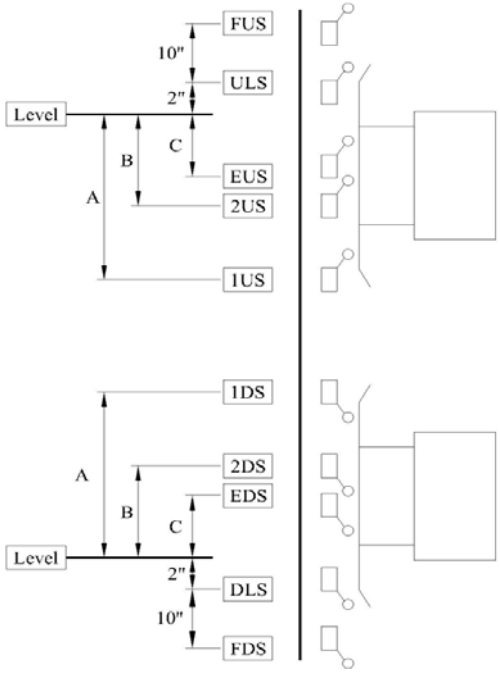
3. Hall IND Button Communication Wiring and confirmation of Communication

- Wiring
  - Connect Red Color Wire to Housing 35156-4P #4 Pin (P24)
  - Connect Green Color Wire to Housing 35156-4P #3 Pin (N24)
  - Connect Black Color Wire to Housing 35156-4P #2 Pin (RT+)
  - Connect White Color Wire to Housing 35156-4P #1 Pin (RT-)
- Confirmation of Communication and Error fix tips :
  - Check the flickering speed of Hall communication LED in control panel, If it flashes fast, it is fine. If not, try to switch the wire between black and white color wires RT(+), RT(-). Check again the LED flickering speed.
  - Check the flickering speed of LD1 and TxA led in HIB Board, if it flashes fast, it is fine. If not, try to switch the wire between RT(+) and RT(-), then double check the LED flickering speed.
  - In case none of the above mentioned works, remove all communication lines, and recheck it floor by floor while rewiring from the top floor. (But, remove the wiring in the revered order of wiring). If you find an error floor, try to replace the H1B Board and double check the LED flickering speed.

6-4. Encoder Check

- Power : DC 24V ,
- Output Phase : A,B Phase Low Active
- Pulse : 1024
- Encoder installed on governor detects the location of car.
- Encoder data value can be checked on operator initiative second display.
- When car moves up, data value should be increased. When car moves down, data value should be decreased.
- Switch A and B if data value is not correct.

6-5. Limit Switch Installation

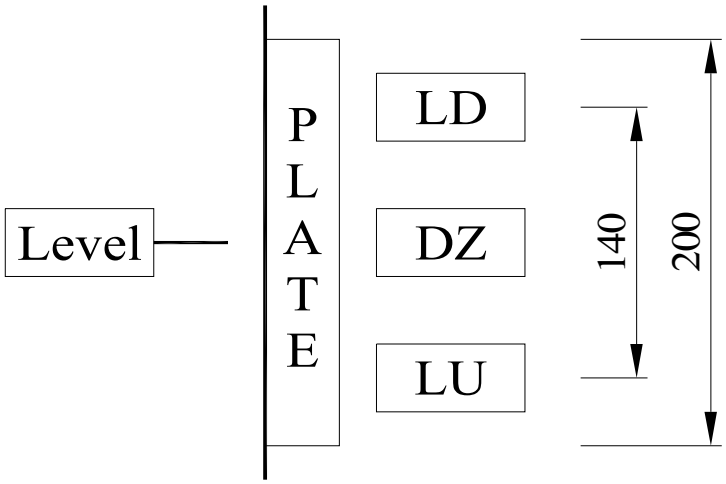


SPEED	A	B	C	REMARK
200(FPM)	45"	--	--	
300(FPM)	80"	45"	40"	
350(FPM)	105"	45"	40"	
400(FPM)	110"	45"	50"	

Note : Test the ETS Switch on the field.

6-6. Leveling Sensor Installation

- Correctly install plate or sensor at each floor. If it is incorrectly installed, level errors can occur.
- Distance between Plate and Sensor(30mm) can be found under the [Lift Data] → [Stop Length] value located in the Inverter.
- Sensor distance should be adjusted if you change [Stop Length] Data in Inverter.
- Once installation is completed, PLC input of DZ Relay and movement LU or LD should be checked.



6-7. Serial Board Installation

- COP and Hall Boards are serial communication and have transmit-receive functions.
- Set address of each floor as shown in manual.
- Address should not be duplicated.
- Power Jack should be plugged in and out when you change address. Boards recognize address only at initial operation.
- LED1 indicates board movement state and blinks once every second.
- RXA is communication data receive state indicator and may blink irregularly.

6-8. Door Operator Installation

- Install Operator as it is shown on electrical drawings with reference system.
- Check the direction of DO/DC and Door Open/Close of Control.
- Check PLC input of DOL(Door Open Limit) and DCL(Door Close Limit), this can be done on handheld under MONIT Menu.
- Adjust Open & Close acceleration and deceleration for fluent door operation.
- Adjust space/clearance between Door Vane/Clutch and Hall Door Roller to conform to standard provisions.
- Adjust appropriate space/clearance of Gate SW for proper operation.
- Door Signal Type can be set on the Service Tool.

6-9. Door Adjustment

- Place F5-1, F5-2 Fuse ON
- Check door volt 230VAC (Terminal 33L, Terminal 33N).
- Place car on hoistway and check the settings of car door
- Place car on inspection position and operate door by Open/Close switch of door controller
- Follow the adjustment of door operation procedures in manufacturer's instruction.

6-10. Safety Switch Check

- Verify Hoistway, Car and Car-Top Switches
- All connections should be harnessed and each switch should be connected directly.
- Governor S/W should be connected between Terminals 1 and 2.
- Safety Chain should be connected between JH1-1 and JH1-2.
- Car Safety Chain should be connected between JC1-1 and JC1-2
- If all Safety Switches are connected correctly, SAF Relay will be ON.
- Hatch Door Locks should be connected between JH1-3 and JH1-4.
- Car Gate Switch should be connected between JC1-4 and JC1-5
- DOL(Door Open Limit) should be Closed and DCL(Door Close Limit) should be open. If there is Rear Door, Limit status will be same.
- The signals mentioned above can be checked under the MONIT Mode of the Service Tool.

Note : At this time Controller INSP should only operate if Cartop Inspection, In-car Inspection and Access Mode in OFF position and Door Bypass Switch in Normal Position

6-11. Inspection Operation

- Check any fault by checking input signal of PLC.
  (I:0.0/0, I:0.0/2, I:0.0/3,…...)
- Detected fault circuit should be checked and restored.
- Car comes first on INSP mode.
- Control panel Up/Down Switch can be manually operated when switch in Car Top Box is on Automatic. If switch in Car Box is on INSP, control panel can not be operated on INSP.
- You can manually run the elevator by using the Up/Down Switch in the Control Panel.
- Check the adjustment of inspection speed.
  1. DRIVE MENU → 1.1 LIFT → LIFT FUNCTION → INSPECTION MODE
  → INSPECTION SPEED : 6.0Hz
- Check Normal Limits by driving elevator manually.

6-12. Test Switch

- Place test switch on Test position.
- Apply this switch when inspection or adjustment is on. It prevents the operation of car independent service and door opening by controller.

6-13. Hoistway Learn

- PLATE on each floor or landing sensor in car should be installed.
  Check the movement.
- Check the location of installed limit switch by driving manually.
- Door operator should be installed and open, close should be operated properly.
- Check hoistway, car safety switch or door switch for safe operation
- Access to [SELECT MENU] → [OPERAT] → [CALIBRATION] by using DOP-100.
- Cursor will appear if you press [set].
- Select [Yes] and [set] by [▲] [▼]
- Once calibration activates, car moves down from present to DLS.
- Car moves up from DLS to ULS.
- The calibration will end if the ULS action occurs due to the car rising.
  the data, then calibration is done.
- If calibration is done, return leveling speed of inverter. (caution)
- If calibration is done, set the necessary data of display, distance etc.

6-14. Auto Operation

- Automatic drive can be operated by car or hall call and by operator.
- Once test switch of controller is On, hall call will not move and door will not open.
- CALL INPUT OPERATION
  Initial LCD→[MENU]→[OPERAT]→[SET]→**[▼]**

a. Call Input

		[	C	A	L	L		I	N	P	U	T	]		
W	o	r	k						:		s	e	t		
P	r	e	v	i	o	u	s		:		u	p			
N	e	x	t						:		d	o	w	n	

- Press [SET] to select Call Input Mode.

		[	C	A	L	L		I	N	P	U	T	]		
	F	=	[		2	]		C	=	[		4	F]		
0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

- Mode that car can be operated as Operator
- F = indicates present Car location.
- C = indicates present Cursor location.
- Move cursor where you intend to move by [◄] [►].
- Set floor of data as 1 where you intend to move by [▲] [▼].
- Once you set data and press [SET], car is automatically operated.

b. Repeat Operator

Initial LCD→[MENU]→[OPERAT]→[SET]→**[▼]**→**[▼]**

	[	R	E	P	E	A	T		O	P	E	R	]		
			E	V	E	N			[	N	O	]			
				O	D	D		[	Y	E	S	]			
			E	A	C	H			[	N	O	]			

- This is the Auto Repeat Operation mode.
- Press [SET] to go to the select menu.

	[	R	E	P	E	A	T		O	P	E	R	]		
			E	V	E	N			[	N	o	]			
				O	D	D		[	Y	e	s	]			
			E	A	C	H			[	N	o	]			

- Select which mode to apply with [▲][▼].
- Press [SET] to go to the cursor, then use [▲][▼] to select YES or NO.

	[	R	E	P	E	A	T		O	P	E	R	]	
			E	V	E	N			[	N	O	]		
				O	D	D		[	Y	E	S	]		
			E	A	C	H			[	N	O	]		

- After selecting Drive mode, press [SET] to drive continuously.
- You are able to set 1 operation mode at a time. If you change the mode, then the previous mode will turn to NO.

7. Elevator Safety Test

The following procedure is a guide for elevator inspection and safety test. Safety Codes include all local codes for elevator and special requirements.

Caution : Safety test should be performed by certified adjuster or service personnel, and staff should be at the site during test.

Service Tool will be used to perform many of the tests. Tests can be found under PROG Menu.

In order to Reset Controller to Normal Status after testing, follow the steps below;

- Test Switch OFF
- Reset SW ON - OFF
- AUTO/INSP Switch ON - OFF

During Testing Procedures it is Best to leave Controller in Test Mode.

7-1 Perform Hatch Inspection

- Test Safety Devices
  - Pit Switches
  - Door Locks
  - Car Top Switches
  - Overhead Switches
  - etc.

7-2 Perform Fire Test

- Per Local Code

7-3 Other Tests

- 2-Way Communication
- Emergency Light
- etc.

7-4 Normal Limit and Final Limit Test

- Up Direction
  - Place Elevator at Top Landing
  - Turn Test Switch to Test Position
  - Turn AUTO/INSP Switch to INSP Position
  - Run Elevator Up with Up/Down Switch
  - Elevator will Stop once the ULS Relay Opens
  - Verify Elevator will only run Down
  - Place jumper on T1-32 to T1-34 to jump ULS Limit
  - Run Elevator Up with Up/Down Switch
  - Elevator will Stop once the UFL Indicator Light comes ON
  - Verify Safety Chain is Open and Elevator will not run in either direction
  - Jump T1-20 to T1-21 to lower Elevator to Top Landing
  - Remove all jumpers and Reset Controller

- Down Direction
  - Place Elevator at Bottom Landing
  - Turn Test Switch to Test Position
  - Turn AUTO/INSP Switch to INSP Position
  - Run Elevator Down with Up/Down Switch
  - Elevator will Stop once the DLS Relay Opens
  - Verify Elevator will only run Up
  - Place jumper on T1-32 to T1-33 to jump DLS Limit
  - Run Elevator Down with Up/Down Switch
  - Elevator will Stop once the DFL Indicator Light comes ON
  - Verify Safety Chain is Open and Elevator will not run in either direction
  - Jump T1-20 to T1-21 to raise Elevator to Bottom Landing
  - Remove all jumpers and Reset Controller

7-5 Normal Terminal Stopping Device Test (NTS)

- Up Direction
  - Place Car 3 Floors Below Top Landing
  - Turn Test Switch to Test Position
  - Remove GOV Encoder Inputs from PLC I:0.0 (INA) and I:0.1 (INB)
  - On Service Tool select NTS Test then select Up
  - Elevator runs up and Activates 1US and 2US (Mech. SLDN's) and levels into floor
  - Reconnect GOV Encoder Inputs on PLC
  - Reset Controller
  - Run Elevator either Up or Down on INSP so Encoder can find its count

- Down Direction
  - Place Car 3 Floors Above Bottom Landing
  - Turn Test Switch to Test Position
  - Remove GOV Encoder Inputs from PLC I:0.0 (INA) and I:0.1 (INB)
  - On Service Tool select NTS Test then select Down
  - Elevator runs down and Activates 1DS and 2DS (Mech. SLDN's) and levels into floor
  - Reconnect GOV Encoder Inputs on PLC
  - Reset Controller
  - Run Elevator either Up or Down on INSP so Encoder can find its count

7-6 Emergency Terminal Stopping Device Test (ETS)

- Down Direction
  - Place Car 3 Floors Above Bottom Landing
  - Turn Test Switch to Test Position
  - On Service Tool select ETS Test then select Down
  - Elevator runs down to Terminal Floor abruptly stops and comes Out-of-Service
  - Reset Controller

7-7 CWT Buffer Test - Empty Car

- Place Elevator 3 Floors below Top Landing
- Turn Test Switch to Test Position
- On Service Tool select CWT Buffer Test then select Yes
- Elevator runs Up and CWT strikes buffer
- Turn AUTO/INSP Switch to INSP Position
- Jump T1-20 to T1-21
  - Verify SAF is now UP, if UP Safety Chain is good, run elevator Down to Top Landing on INSP

  NOTE: If SAF is NOT UP; check Plank Switch, Governor Switch and Tail Sheave Switch
- Verify Hoist Cables are in Alignment
- Remove all Jumpers
- Reset Controller

7-8 Un-Intended Movement Test

- Up Direction
  - Place Car at Intermediate Floor
  - Register Top Floor Call
  - As Elevator Levels at Top Landing manually pick MAIN Brake
  - Elevator will stop, level and begin to open doors.
  - Elevator will immediately drift and Emergency Brake will apply
  - Emergency Brake Indicator will come ON
  - Elevator will come Out-of-Service
  - Reset Controller
  - Verify SAF is UP

- Down Direction
  - Place Car at Intermediate Floor
  - Register Bottom Floor Call
  - As Elevator Levels at Bottom Landing manually pick MAIN Brake
  - Elevator will stop, level and begin to open doors.
  - Elevator will immediately drift and Emergency Brake will apply
  - Emergency Brake Indicator will go out
  - Elevator will come Out-of-Service
  - Reset Controller
  - Verify SAF is UP

7-9 Overspeed Test

- Up Direction
  - Place Elevator at Bottom Landing
  - Turn Test Switch to Test Position
  - Record all Values in Lift Data in Inverter. (Drive Menu>Lift>Lift Configuration>Lift Data)
  - Record Max Frequency Value (Drive Menu>Motor Control>Max Frequency)
  - Record High Speed Value (Drive Menu>Setting>High Speed)
  - Record Lift Top Speed Value (Drive Menu>Lift>Lift Configuration>Lift Data>Lift Top Speed)

Nominal Car Speed:	Stop Length:
Capacity of the Lift:	Lift Leveling Speed:
Car Weight:	Lift Leveling Time:
Counterweight	Deceleration Length:
Comfort Accel.:	Max Frequency Value:
Lift Top Speed:	High Speed Value:
Acceleration Time:	Lift Top Speed:

  - Increase Max Frequency, High Speed Value and Lift Top Speed 150%
  - On Service Tool select Overspeed Test then select Up
  - Elevator runs up and triggers GOV Overspeed Switch
  - Turn AUTO/INSP Switch to INSP Position
  - Return all values back to original settings and verify all Lift Data Values
  - Jump T1-1 to T1-2 and T1-24 to T1-27. Allows you to move car in Up direction only.
  - Reset Electrical Switch and Hammer on Governor
  - Remove all Jumpers
  - Reset Controller

7-10 Machine Traction Test

- Up Direction
  - Turn Test Switch to Test Position
  - Place Elevator at Top Landing
  - Place a Jumper on T1-20 to T1-27 and on T1-34 to T1-33 to jump ULS Limit.
  - On Service Tool select MCH TRAC Test
  - On Service Tool hold Up Button (Continuously), the Motor will turn and the CWTwill hit buffer and stop moving, Motor will keep turning
  - Turn AUTO/INSP Switch to INSP Position
  - Run Car Down off Limits using Down Switch in Controller
  - Remove all Jumpers
  - Reset Controller

- Down Direction
  - Turn Test Switch to Test Position
  - Place Elevator at Bottom Landing
  - Place a Jumper on T1-20 to T1-27 and on T1-32 to T1-33 to jump DLS Limit.
  - On Service Tool select MCH TRAC Test
  - On Service Tool hold Down Button (Continuously), the Motor will turn and the car will hit buffer and stop moving, Motor will keep turning
  - Turn AUTO/INSP Switch to INSP Position
  - Run Car Up off Buffer and Limits using Up Switch in Controller
  - Remove all Jumpers
  - Reset Controller

7-11 Brake Test

- Place the car one floor above bottom landing
- Turn Test Switch to Test Position
- Load Elevator with 125% Capacity
- Send Elevator to Bottom Landing with Service Tool

- When elevator stops shut of Main Line Power
- Manually pick Emergency Brake, Main Brake will hold elevator, then Release
- Manually pick Main Brake, Emergency Brake will hold elevator, then Release
- Restore Main Line Power
- Remove Weights from Elevator
- Return Elevator to AUTO

7-12 Emergency Terminal Stopping Device Test (ETS)

- Up Direction - Full Load
  - Load Elevator with 100% Capacity
  - Place Car 3 Floors Below Top Landing
  - Turn Test Switch to Test Position
  - On Service Tool select ETS Test then select Up
  - Elevator runs up to Terminal Floor abruptly stops and comes Out-of-Service
  - Reset Controller

7-13 Car Buffer Test - Full Load

- Load Elevator with 100% Capacity
- Place Elevator 3 Floors above Bottom Landing
- Turn Test Switch to Test Position
- On Service Tool select Car Buffer Test then select Yes
- Elevator runs Down and Car strikes buffer
- Turn AUTO/INSP Switch to INSP Position
- Jump T1-20 to T1-21
  - Verify SAF is now UP, if UP Safety Chain is good, run elevator UP to Bottom Landing on INSP

  NOTE: If SAF is NOT UP; check Plank Switch, Governor Switch and Tail Sheave Switch
- Verify Hoist Cables are in Alignment
- Remove all Jumpers
- Reset Controller

7-14 Overspeed Test

- Down Direction - Full Load
  - Load Elevator with 100% Capacity
  - Place Elevator 3 Floors above Bottom Landing
  - Turn Test Switch to Test Position
  - Record all Values in Lift Data in Inverter. (Drive Menu>Lift>Lift Configuration>Lift Data)
  - Record Max Frequency Value (Drive Menu>Motor Control>Max Frequency)
  - Record High Speed Value (Drive Menu>Setting>High Speed)
  - Record Lift Top Speed Value (Drive Menu>Lift>Lift Configuration>Lift Data>Lift Top Speed)

Nominal Car Speed:	Stop Length:
Capacity of the Lift:	Lift Leveling Speed:
Car Weight:	Lift Leveling Time:
Counterweight	Deceleration Length:
Comfort Accel.:	Max Frequency Value:
Lift Top Speed:	High Speed Value:
Acceleration Time:	Lift Top Speed:

  - Increase Max Frequency, High Speed Value and Lift Top Speed 150%
  - On Service Tool select Overspeed Test then select Down
  - Elevator runs Down and applies Safety
  - Turn AUTO/INSP Switch to INSP Position
  - Return all values back to original settings and verify all Lift Data Values
  - Jump T1-1 to T1-2 and T1-20 to T1-27. Allows you to move car in Up direction only.
  - Reset Electrical Switch and Hammer on Governor and Plank Switch
  - Remove all Jumpers
  - Reset Controller

8. PLC LCD INDICATOR

LCD display has 4 pages. If you press OK key, display will indicate pages order as

1 -> 2 -> 3 -> 4 -> 3 -> 2 -> 1. If no error occurred, pass page 3.

1. Page 1

	□	□	□	□	□	□					R	E	M	O	T	E
2C	M	O	D	:	A	U	T	O								
3C	F	L	R	:		1		D	I	R	:	U	P			
4C	S	P	D	:	2	0	0	[	F	P	M	]				

- 2C : Displays mode of elevator operation status.
- 3C : Displays elevator floor or movement direction.
- 4C : Displays elevator speed.

2. Page 2

	□	□	□	□	□	□					R	E	M	O	T	E
2C	A	C	T	:	R	e	a	d	y							
3C	E	N	C	:		1	0	1	0	2						
4C	V	I	N	:	2	.	1	[	V	D	C	]				

- 2C : Displays mode of elevator operation status.
  If error occurred, Fault will appear.
- 3C : Displays encoder data.
- 4C : Displays value of detected load data.

3. Page 3

	□	□	□	□	□	□					R	E	M	O	T	E
		[	F	A	U	L	T		M	E	S	S	A	G	E	]
3C	U	L	S		O	F	F									
4C	F	L	R	:		1		D	I	R	:	D	o	w	n	

- 3C : Displays fault details
- 4C : Displays elevator floor and operation direction.

4. Page 4

	□	□	□	□	□	□					R	E	M	O	T	E
		P	L	C		S	o	f	t	w	a	r	e			
3C			H	M	1	.	0	.	0							
4C			2	0	1	1	-	0	3							

- 3C : Displays software version
- 4C : Displays software date.

9. Error Code Table

CODE	Display	Explanation
1	GOV OFF	* Governor Trip Error
		☞ Check Governor
2	SAF Chain OFF	* Safety line signal is not entered
		☞ Check Safety line.
3	Non OFF Door SW	* Door switch is not OFF.
		☞ Check door switch or connection
4	Non OFF DOL	*When Door Open, DOL is not OFF.
		☞ Check DOL switch or connection.
5	Non ON Door SW	* Door switch is not entered.
		☞ Check door or switch connection.
6	Non OFF DCL	* When door closed, DCL is not OFF
		☞ Check DCL switch or connection.
7	UD Door SW OFF	* Door switch is Off and stopped during operation.
		☞ Check Hall door interlock switch .
8	ULS OFF	* ULS is activated.
		☞ Adjust distance or limit switch location.
9	DLS OFF	* DLS is activated.
		☞ Adjust distance or limit switch location.
10	1DS OFF	* 1DS signal is not entered.
		☞ Check limit switch or connection.
11	1US OFF	* 1US signal is not entered.
		☞ Check limit switch or connections.
12	2DS OFF	* 2DS signal is not entered
		☞ Check limit switch or connections.
13	2US OFF	* 2US signal is not entered
		☞ Check limit switch or connections.
14	Non DOL	* DOL is not entered so unable to open
		☞ Check limit switch or connections.
15	Non DCL	* DCL is not entered so unable to close
		☞ Check limit switch or connections.
16	Over Run Stop	* Bypass all levels and stop
		☞ Adjust deceleration distance.
17	Over Stop UP	* Bypass level up and stop.
		☞ Adjust deceleration distance

18	Over Stop DN	* Bypass Level down and stop.
		☞ Adjust deceleration distance
19	Non Door Zone	* DZ signal is not entered.
		☞ Check door zone switch or connections.
20	Bypass SW ON	* Bypass switch is ON.
		☞ Check bypass switch.
21	Brake SW ON Fault	* Brake switch is not OFF.
		☞Check brake switch or connection.
22	Brake SW OFF Fault	* Brake switch is not entered / no input
		☞Check brake switch or connection.
23	MKM ON Fault	* Motor contact is not OFF.
		☞ Check contact circuit.
24	MKM OFF Fault	* Motor contact is not entered / no input.
		☞ Check contact circuit.
25	Inverter Fault	* Inverter Error
		☞ Check inverter
26	Encoder Fault	* Encoder error
		☞ Check Encoder circuit or connections.
27	Phase Fault	* Phase input error
		☞ Check phase relay connections.
28	RTH Fault	* Braking unit is overheated.
		☞ Check inverter or resistance
29	Car Comm Err	* Car Communication Error
		☞ Check board or communication track
30	Hall Comm Err	* Hall Communication Error
		☞ Check board or communication line
31	Door Comm	* Door circuit common
		☞ Check door interlock circuit
32	Run time Err	* Run time over.
		☞ Check drive system.
33	Screen Sensor Err	* Screen Sensor Error .
		☞ Check connection or adjustment state .
34	Regen Error	* Regen signal is not entered .
		☞ Check regen.
35	ELD Error	* Regen signal is not entered .
		☞ Check auto rescue device.
36	Rope Gripper Operated	* Rope Gripper Operated .
		☞ Check Safety line and System.